

WHAT IS CLAIMED IS

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1. A semiconductor device, comprising:
a substrate; and

a multilayer interconnection structure
formed on said substrate,

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said multilayer interconnection
structure including: at least first and second
interlayer insulation films provided on said
substrate; and a guard ring pattern embedded in
each of said first and second interlayer

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insulation films, said guard ring pattern
extending along a periphery of said substrate,

wherein said guard ring pattern changes
a direction thereof repeatedly and alternately in
a plane parallel to said substrate,

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said guard ring pattern including: a
conductive wall extending in each of said first
and second interlayer insulation films from a
bottom principal surface thereof to a top
principal surface thereof; and a conductive
pattern making a contact with a top part of said
conductive wall and having a principal surface
coincident to said top principal surface of said
interlayer insulation film, said conductive wall
changing a direction thereof repeatedly and
alternately in said plane in correspondence to
said guard ring pattern,

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said conductive wall in said first
interlayer insulation film being offset with
respect to said conductive wall in said second
interlayer insulation film in a direction
parallel to a principal surface of said substrate
toward an interior of said substrate when viewed

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in a direction perpendicular to said principal
surface of said substrate.

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2. A semiconductor device as claimed in
claim 1, wherein said guard ring pattern extends
continuously along said periphery of said
10 substrate.

15 3. A semiconductor device as claimed in
claim 1, wherein said conductive pattern extends
in the form of a straight line along a peripheral
edge of said substrate.

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4. A semiconductor device as claimed in
claim 1, wherein said conductive pattern changes
25 a direction thereof repeatedly and alternately in
said plane in correspondence to said conductive
wall.

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5. A semiconductor device as claimed in
claim 1, wherein said conductive wall and
conductive pattern comprises Cu.

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second groove is conducted such that said second groove changes, in said first groove, a direction thereof alternately and repeatedly in a plane parallel to said substrate.

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9. A method as claimed in claim 8, wherein said step of forming said first groove is conducted such that said first groove extends in a straight pattern along a peripheral edge of said substrate.

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10. A method as claimed in claim 8, wherein said step of forming said first groove is conducted that said first groove changes a direction thereof alternately and repeatedly in said plane in correspondence to said second groove.

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11. A method as claimed in claim 8, wherein said conductive layer is formed of Cu.

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12. A method as claimed in claim 8, wherein said step of forming said interlayer insulation film comprises the steps of: depositing a first insulation film on said substrate; depositing an etching stopper layer on

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said first insulation film; and depositing a second insulation film on said etching stopper layer, said step of forming said first groove comprises the step of: etching said first

5 insulation film until said etching stopper layer is exposed, and wherein said step of forming said second groove comprises the step of etching said etching stopper layer and said second insulation

10 film until said second groove reaches a bottom principal surface of said second insulation film.

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